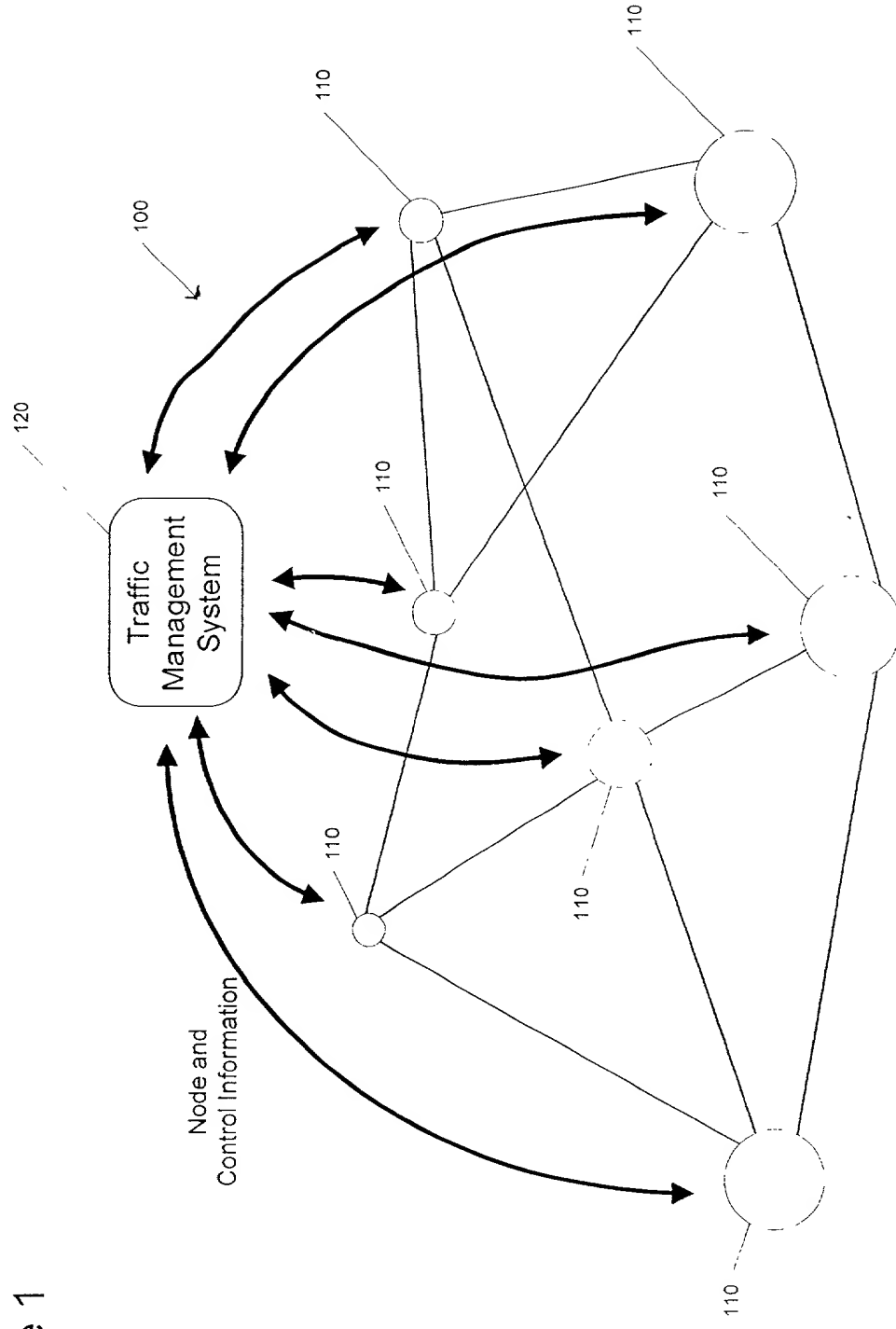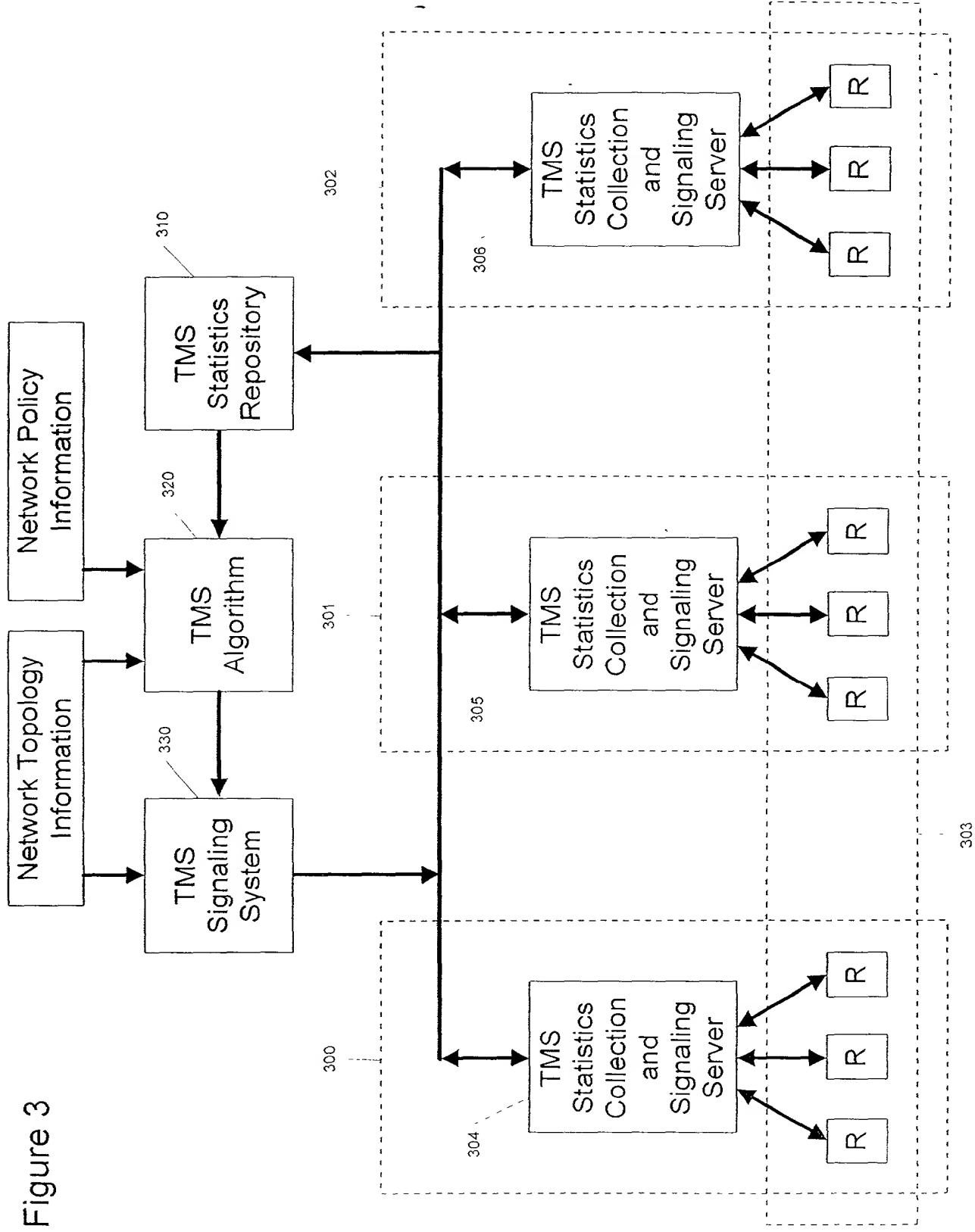Figure 1

Figure 2

Figure 3

Figure 4

Start

TMS-CS
instructs routers to
collect specific
traffic information
400

TMS-CS
receives traffic
information from
routers
410

TMS-CS
processes traffic
information
420

TMS-CS
sends information to
TMS-SR
430

TMS Algorithm
creates a traffic
demand matrix using
information stored in
the TMS-SR
440

TMS Algorithm
uses the traffic
demand matrix to
determine optimal
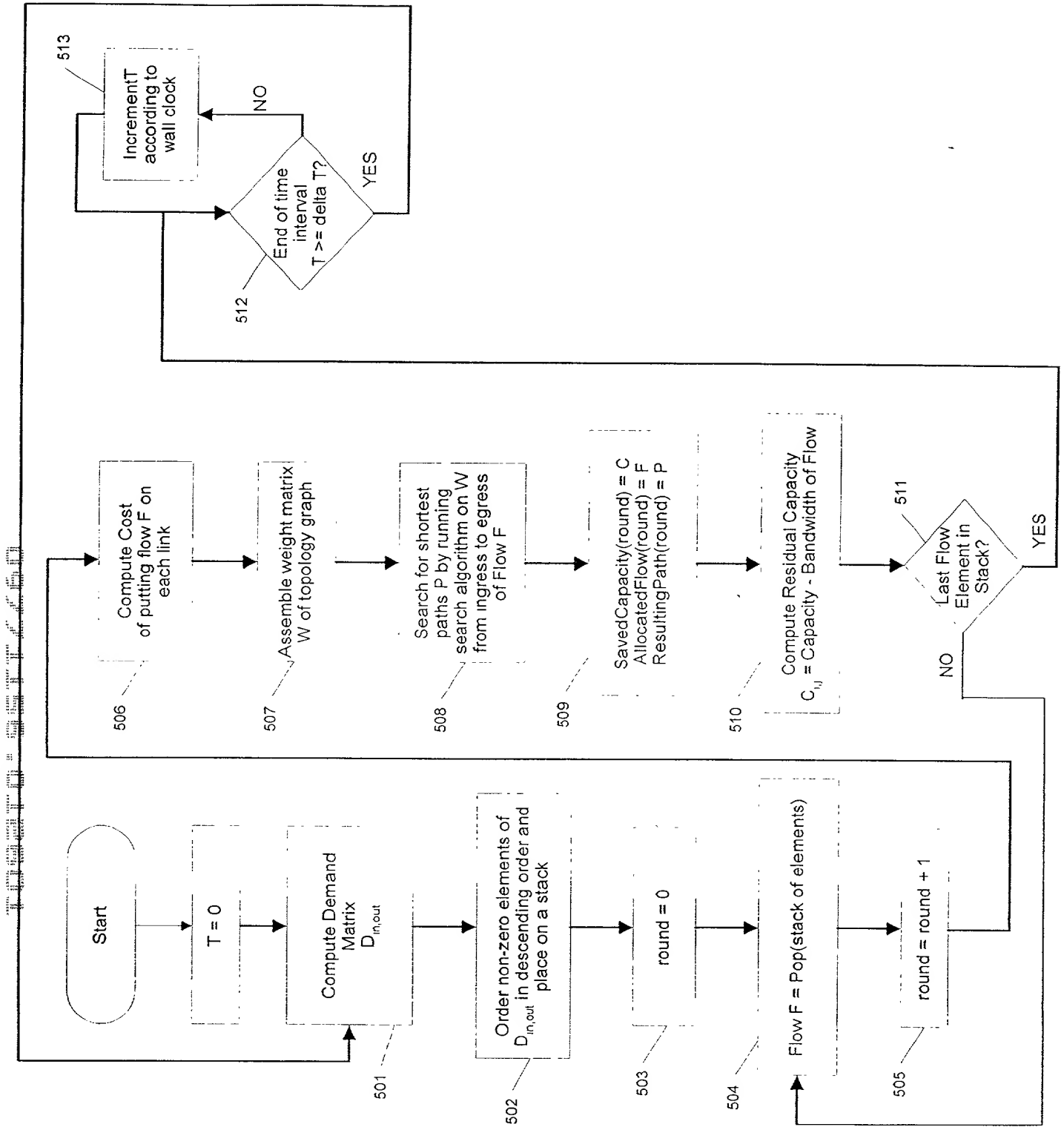nework configuration
450

TMS Signaling
System
receives network
configuration from
TMS Algorithm
460

TMS Signaling
Servers
receive network
configuration from
TMS Signaling
System
470

TMS Signaling
Servers
configure each router
as appropriate
480

Configuration Done
490

Figure 5

Start

↓

T = 0 — 501

↓

Compute Demand
Matrix
$D_{in,out}$ — 502

↓

Order non-zero elements of
$D_{in,out}$ in descending order and
place on a stack — 503

↓

round = 0 — 504

↓

Flow F = Pop(stack of elements)

↓

round = round + 1 — 505

↓

Compute Cost
of putting flow F on
each link — 506

↓

Assemble weight weight matrix
W of topology graph — 507

↓

Search for shortest
paths P by running
search algorithm on W
from ingress to egress
of Flow F — 508

↓

SavedCapacity(round) = C
AllocatedFlow(round) = F
ResultingPath(round) = P — 509

↓

Compute Residual Capacity
$C_{i,j}$ = Capacity - Bandwidth of Flow — 510

↓

Last Flow
Element in
Stack? — 511

NO → (back to Flow F = Pop)

YES

↓

End of time
interval
T >= delta T? — 512

NO → IncrementT
according to
wall clock — 513

YES

Figure 6

POPs

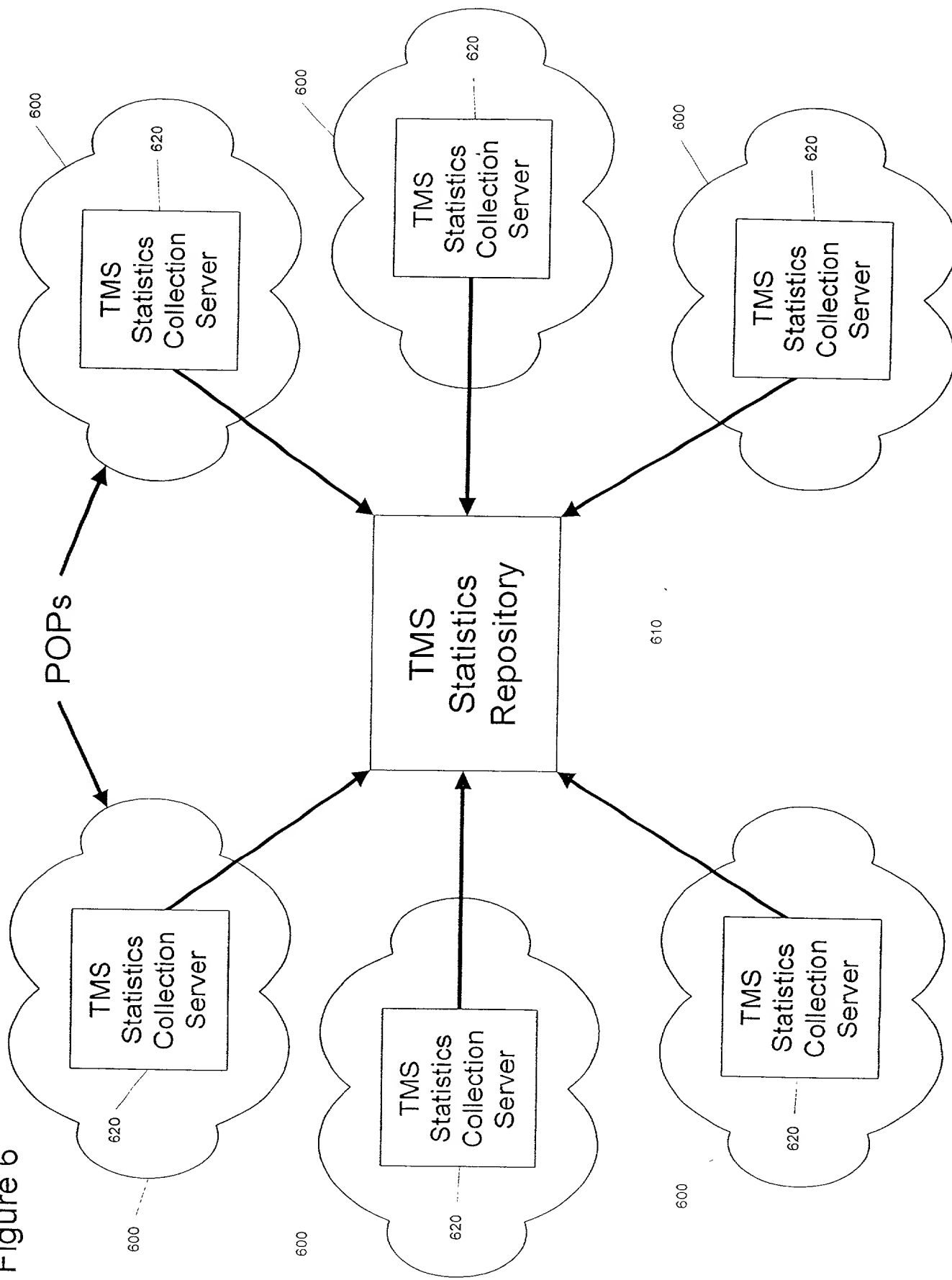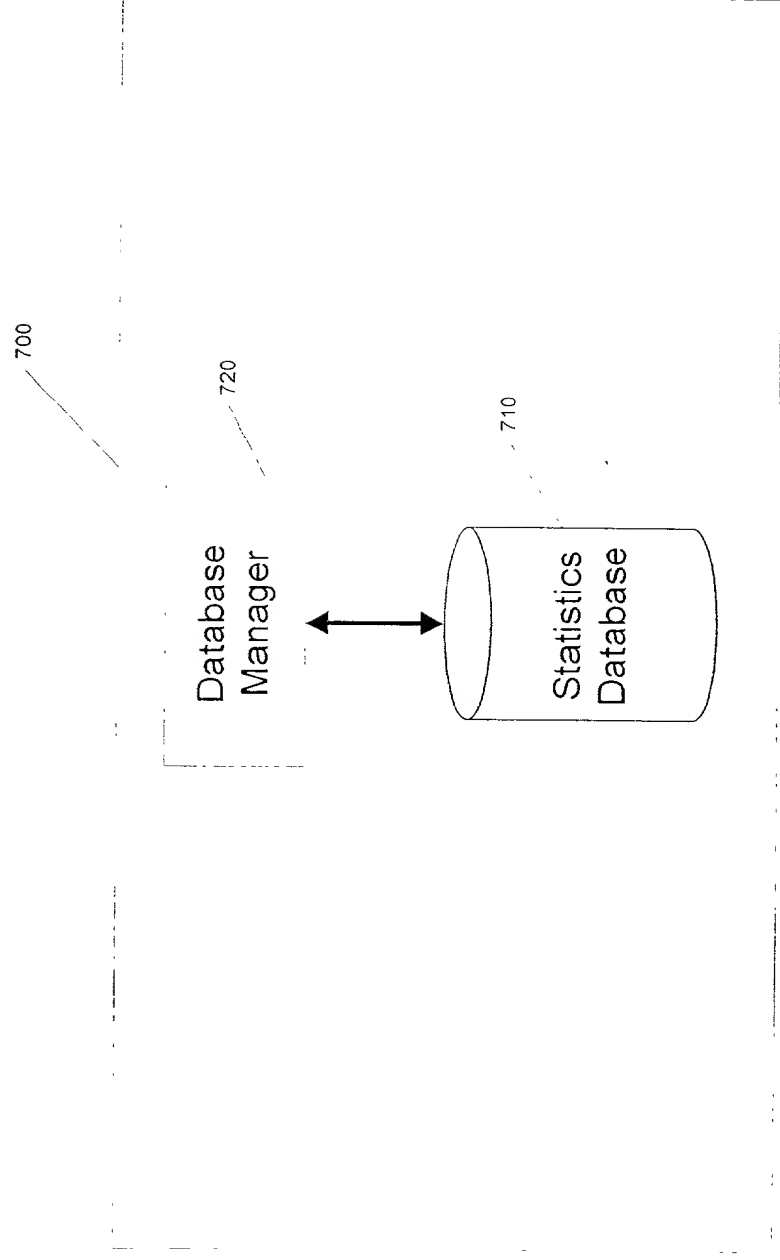Figure 7

700

Database
Manager

720

Statistics
Database

710

TMS Statistics Repository

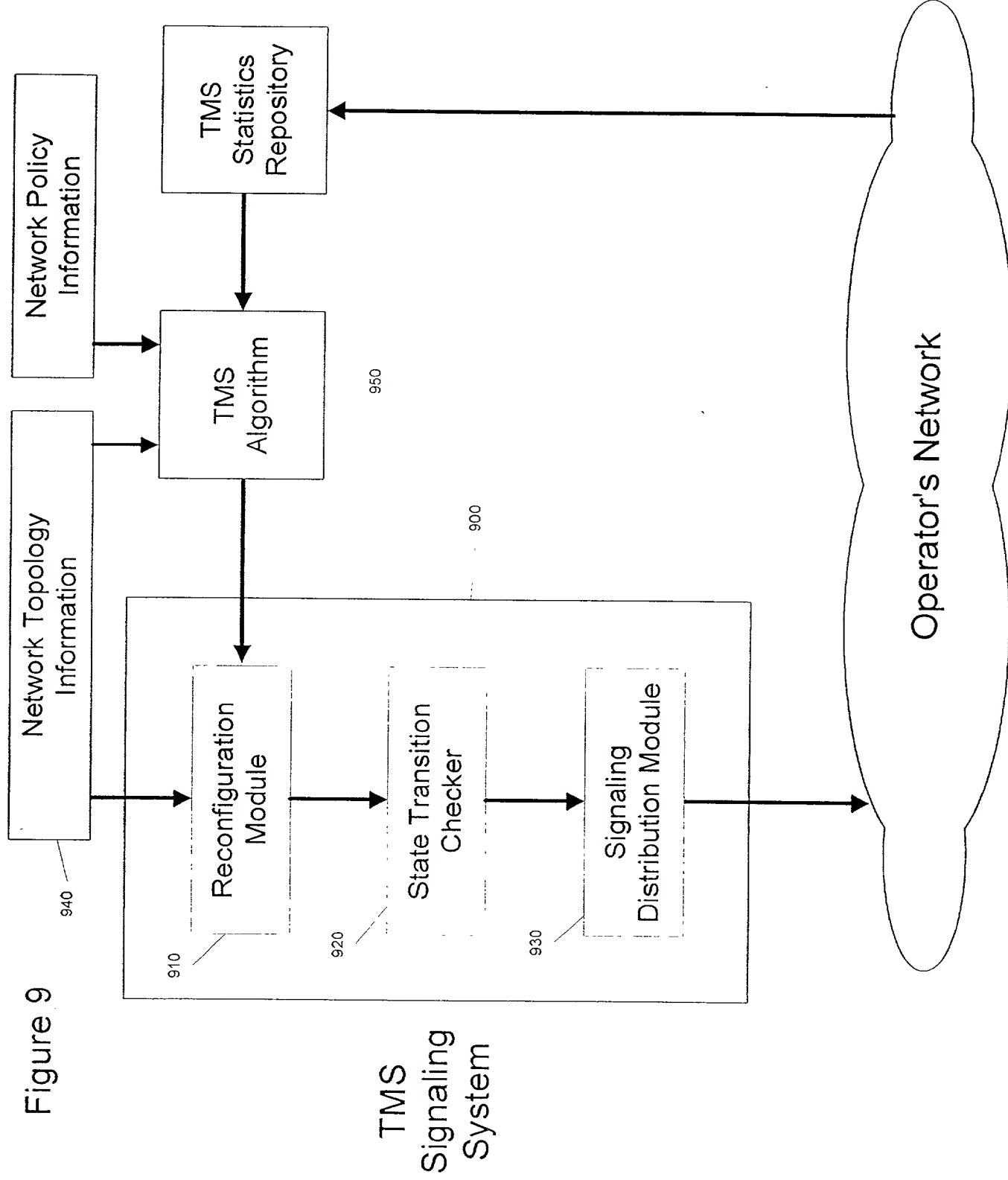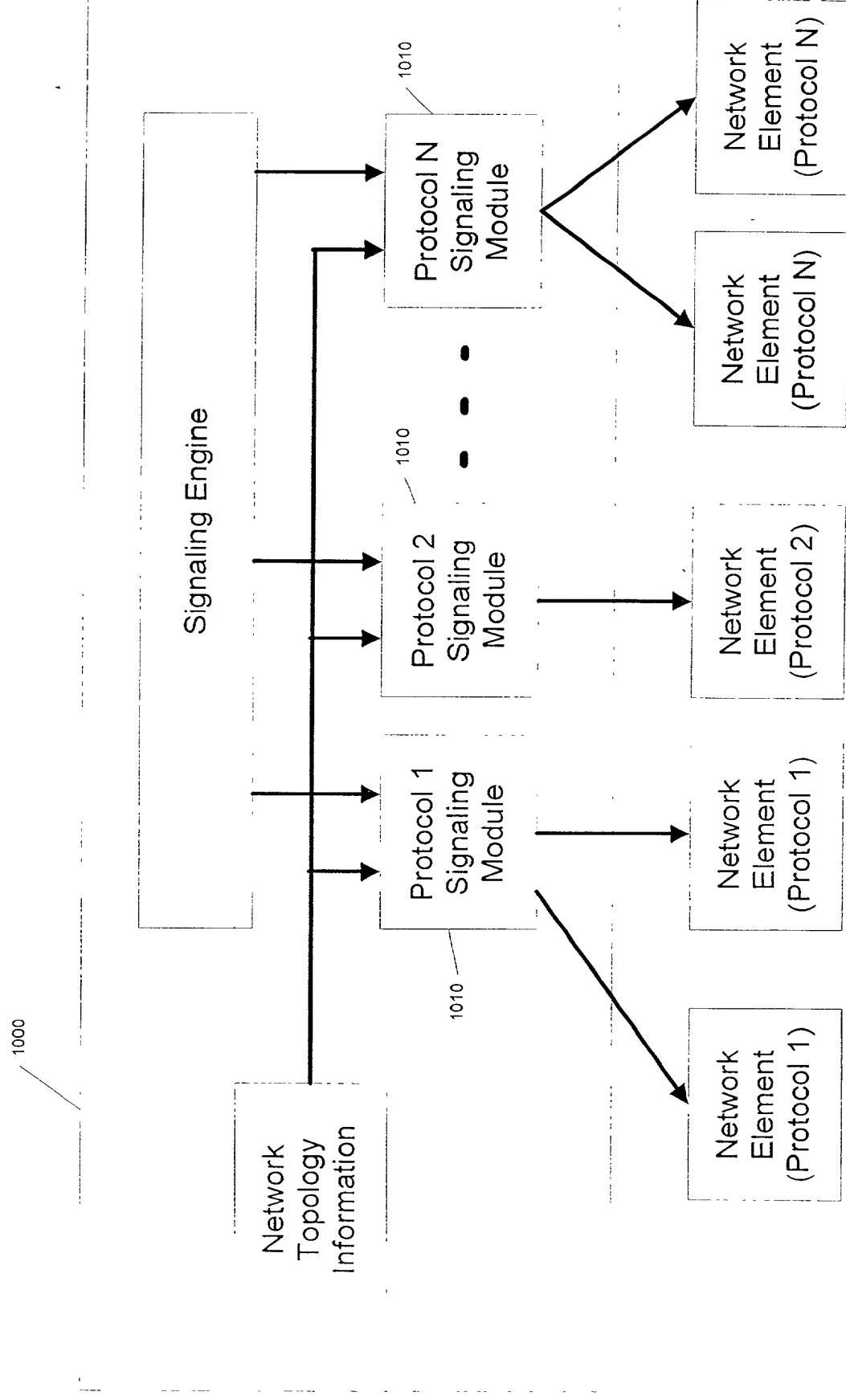Figure 8

800
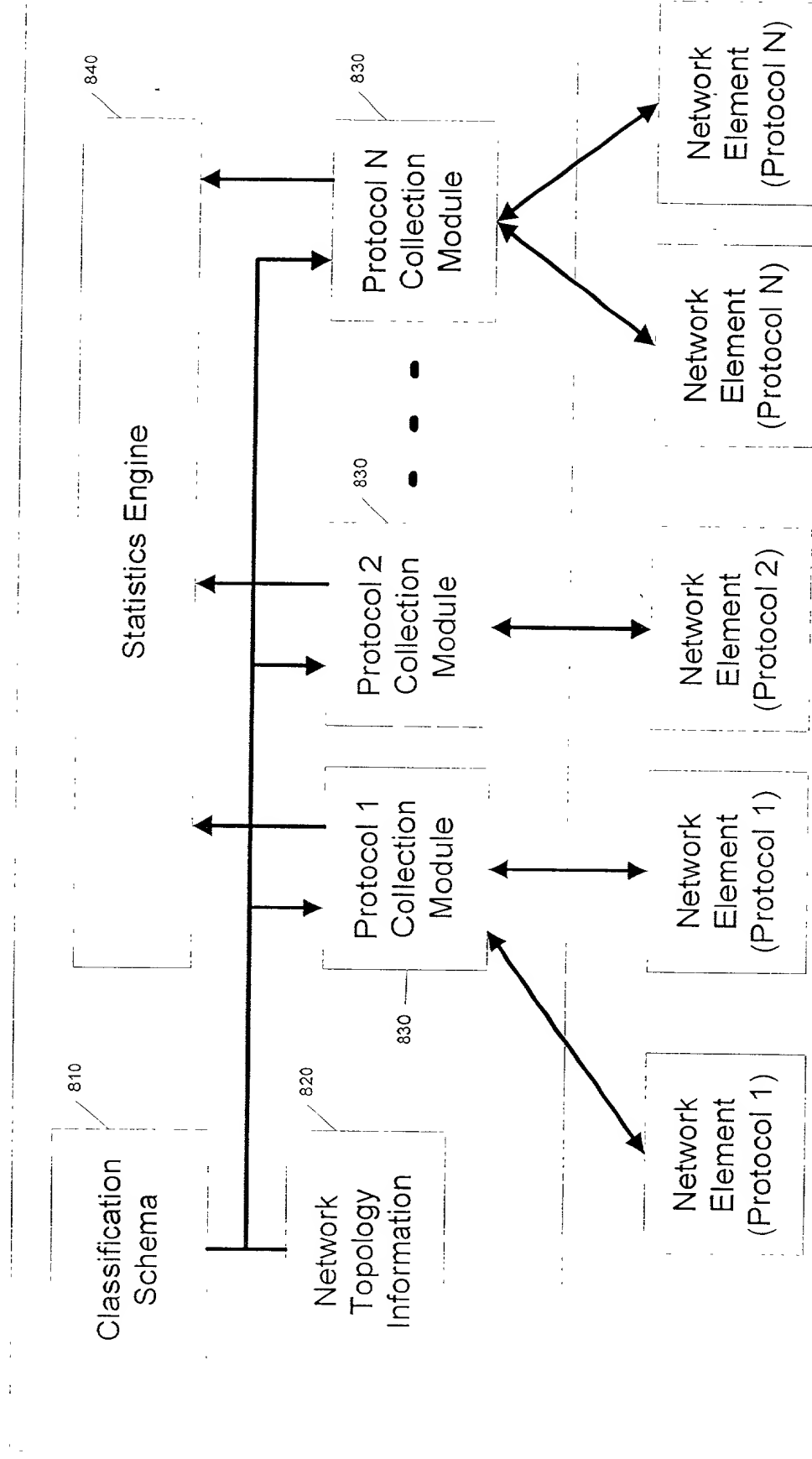
TMS Statistics Collection Server

Figure 9

Network Policy Information

Network Topology Information

TMS Statistics Repository

TMS Algorithm

950

900

940

TMS Signaling System

910 — Reconfiguration Module

920 — State Transition Checker

930 — Signaling Distribution Module

Operator's Network

Figure 10

TMS Signaling Server

Figure 11

Protocol-Specific Module